

# Public Lighting Department



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## MISSION:









The Public Lighting Department's mission is to provide reliable, economic, high quality lighting and energy services that light the streets for safety and are responsive to the needs of the citizens, businesses and visitors to the City of Detroit.

## CORE SERVICES:

The Public Lighting Department operates both an electric and steam power production and generation plant; maintains underground conduits and cable transmission lines; distributes electricity to public and private buildings, street lights and traffic signals; and maintains regulatory control over poles placed in the City's right-of-ways. In addition, Public Lighting maintains the telephone communications system for the Police and Fire Departments.

The following divisions provide services:

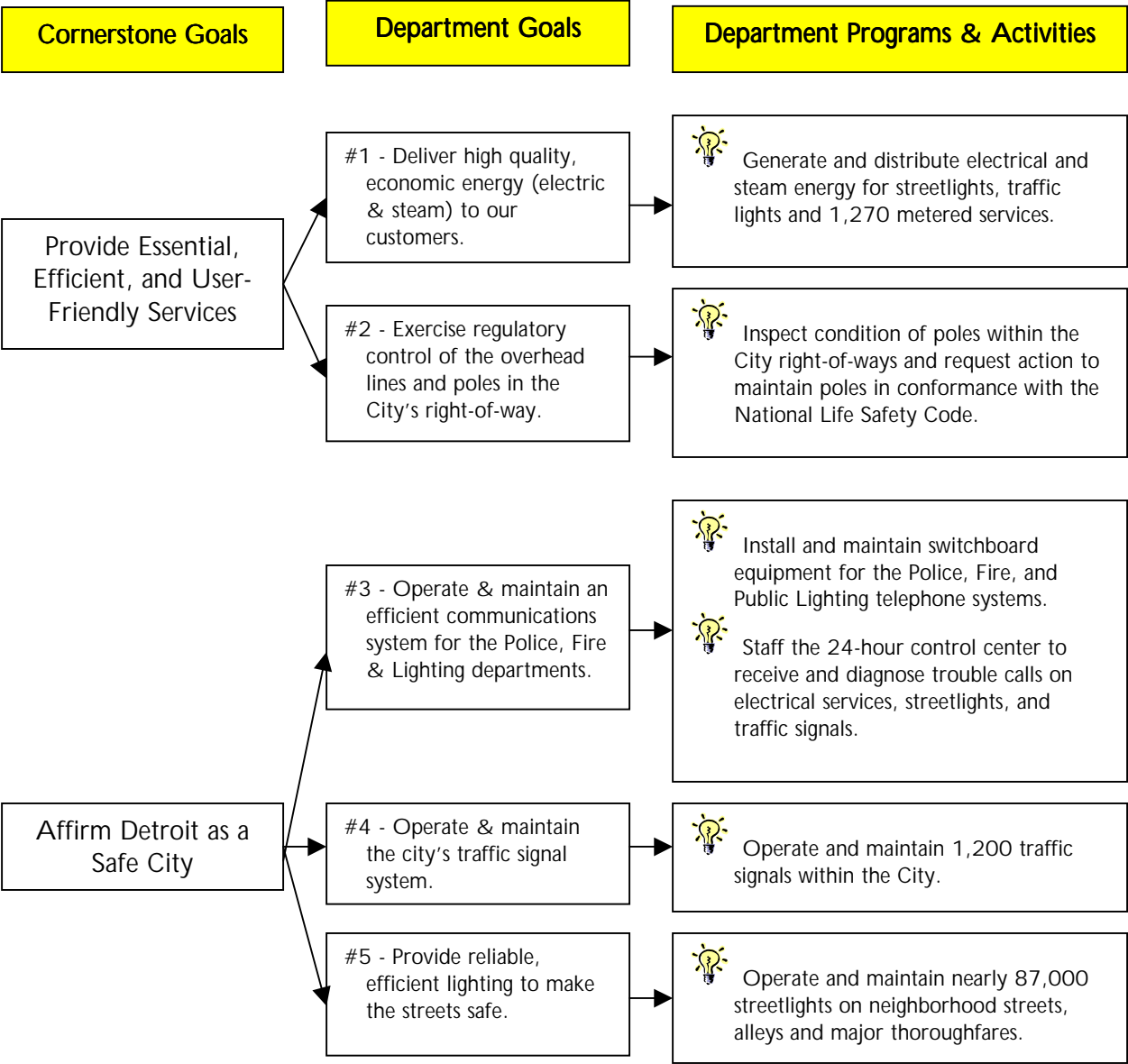
- ♦ Administration, which provides customer service, production control, inspection and safety services;
- ♦ Engineering, which provides design services for street lighting, traffic signals, transmission and distribution; and maintains the underground facilities maps and records;
- ♦ Construction and Maintenance, which provides overhead and underground transmission, distribution and communication lines; traffic signals and street light foundations; repairs and installations;
- ♦ Operating, which provides electrical system control, substation operations, electrical maintenance, traffic signal maintenance, building maintenance and system testing; and
- ♦ Power Production, which operates and maintains an electrical generating facility and a steam heating facility.

Fiscal Year 2001 in Brief:	
2000-2001 Accomplishments	2000-2001 Issues
 Maintained a 95% illumination rate and reduced circuit trouble by installing photocell controls on the remaining circuits.	 Capital investment to upgrade the production and distribution systems, which affect the ability to provide reliable service, is limited by City financial constraints.
 Completed the first phase of the Supervision Control and Data Acquisition (SCADA) base station upgrade.	<b>Future Plans</b>
 Reduced the overhead distribution feeder faults by 27% by trimming trees around the overhead distribution lines.	
 Automated the work order system, which now provides the reporting of street lighting, traffic signal and customer service complaints.	
 Completed the planned phases of the residential streetlight modernization program.	 Develop a long-term power supply plan focusing on providing competitive customer services while operating under existing capital and budget constraints.
	 Continue street lighting modernization in historic neighborhoods and on main thoroughfares.



**GOALS:**

The Department's annual goals and programs relate to two of the Mayor's Cornerstone Goals. The chart below illustrates the alignment of Public Lighting's programs and activities with the Cornerstone Goals.

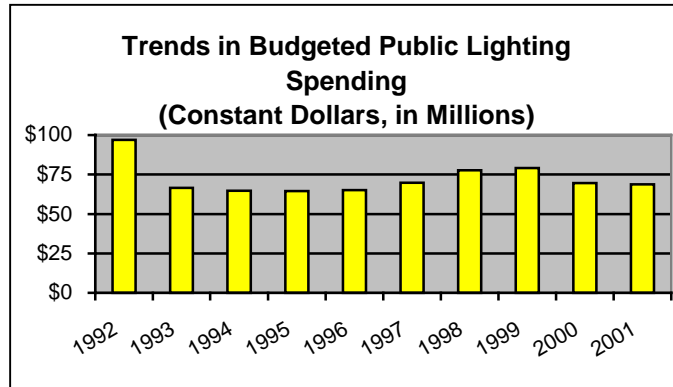


The remainder of this chapter examines the Public Lighting Department's efforts and accomplishments in carrying out specific activities and programs to accomplish its goals.

# PUBLIC LIGHTING SPENDING & STAFFING LEVELS



## SPENDING:

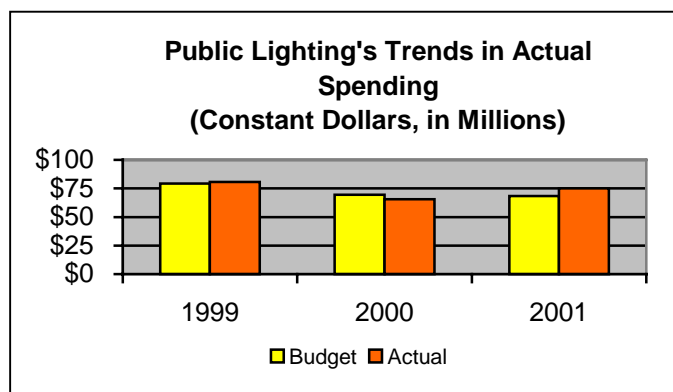
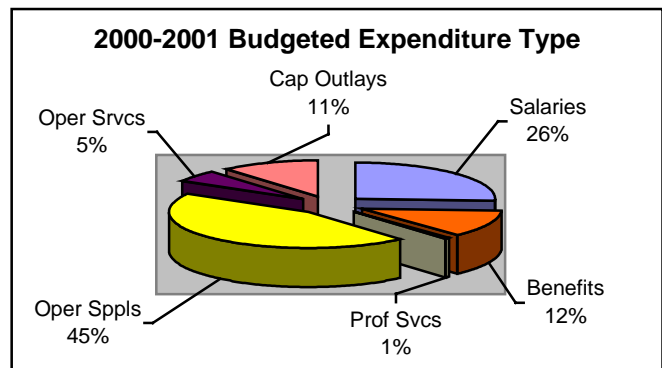


Budgeted spending fell 31% between 1992 and 1993 due to the loss of the Water and Sewerage electric accounts and a reduction in budgeted capital improvements. The Water and Sewerage accounts were transferred to Detroit Edison as part of a larger Greater Detroit Resource Recovery Authority (GDRRA) power deal.

Public Lighting's five-year average budgeted spending has been \$72.9 million, and has averaged 2.7% of the total city budget. 2001 budgeted spending was expected to be \$68.6, 2.5% of the budget.

Salaries and benefits make up 38% of the Public Lighting Department's budgeted spending, which is slightly higher than the five-year average.

Public Lighting's largest expense is Operating Supplies, which includes the fuel needed for power production and the power that is purchased from Detroit Edison. In 2001, these expenditures are estimated to be close to the five-year average. Capital outlays have averaged 16% in previous years. In 2001, they average 11%.



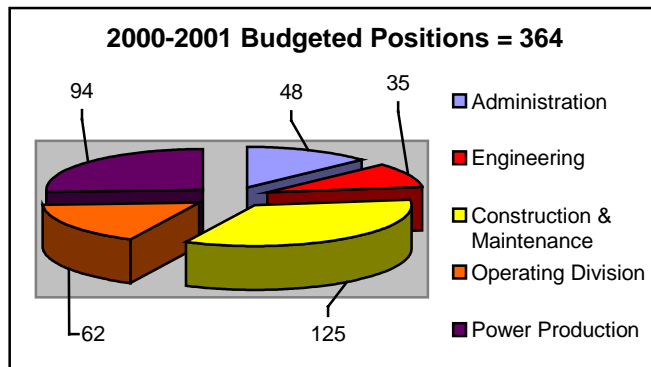
Between 1999 and 2001, inflation adjusted actual spending has ranged from \$65 to \$80 million annually. Spending variances can be attributed to differences in capital improvement spending.

The following table shows the Public Lighting Department's budgeted capital improvement projects. Spending on these projects may be spread over several years.



Name of Project	1997	1998	1999	2000	2001	Total
Street Lights	\$0.0	\$4.0	\$8.5	\$0.0	\$1.3	\$13.8
Transmission/ Distribution	0.0	4.0	0.0	0.0	0.0	4.0
Production	0.0	0.0	0.0	0.0	1.5	1.5
Communications	0.0	1.1	0.0	0.0	0.0	1.1
Other	<u>6.0</u>	<u>2.0</u>	<u>8.0</u>	<u>10.2</u>	4.4	<u>30.6</u>
<b>Total</b>	<b>\$6.0</b>	<b>\$11.1</b>	<b>\$16.5</b>	<b>\$10.2</b>	<b>\$7.2</b>	<b>\$51.0</b>

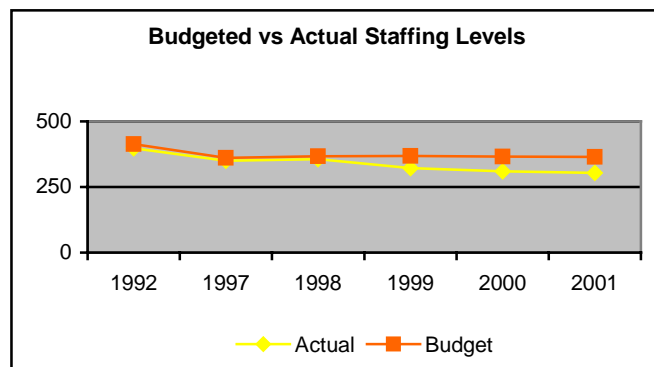
## STAFFING:



Over 34% of the Public Lighting Department's 364 budgeted positions are in Construction and Maintenance, while 26% are in Power Production.

Budgeted positions decreased from 413 to 364 between 1992 and 2001 due to the loss of the Water and Sewerage accounts and to changes made to traffic signal and street lighting services.

The Department has averaged an actual staffing level of 90% over the past five years, but in April 2001 was running at a staffing level of 83% in all divisions. Public Lighting management attributes the staffing shortages to problems with recruiting electrical tradesmen, engineers and draftsmen, and delays in filling positions by Human Resources.



Program specific staffing and spending levels are covered in the remaining pages of this chapter.

## PUBLIC LIGHTING GOAL #1: DELIVER HIGH QUALITY, ECONOMIC ENERGY TO CUSTOMERS



### POWER PRODUCTION:



The Public Lighting Department's energy delivery strategy has always called for supplying a mixture of purchased and produced power to its customers.

- ◆ Public Lighting's decision to produce or to purchase power is complicated and optimally the decision should be reviewed hourly in order to maximize the City's resources. Variables that should be considered are: (1) the condition of the generating equipment, (2) the system constraints regarding capacity, voltage and security, (3) the constraints of the existing purchase power contract with Detroit Edison, (4) the cost of purchased power for the next hour, and (5) the incremental cost of generating for the next hour.
- ◆ No matter what the source of the power, the Public Lighting Department must always hold enough to cover its customers' demands, or peak load, of 115 megawatts per hour.

### CONDITION OF GENERATING EQUIPMENT:



The power production facilities at the Mistersky Power station have a generation capacity of approximately 180 megawatts per hour using four units:

- ◆ Unit #5, with a maximum capacity of 42 megawatts, was installed in 1950 as a coal-burning unit. It was converted to oil firing during the 1970s, and further upgraded to burn either gas or oil in the late 1990s.
- ◆ Unit #6, with a maximum capacity of 50 megawatts, was installed as a coal-burning unit in 1958. Unit #6 went through the same upgrades as Unit #5 during the 1970s and 1990s.
- ◆ Unit #7, installed in 1978 with a maximum capacity of 60 megawatts, will operate using either natural gas or fuel oil.
- ◆ A Gas Turbine engine, installed in 1975 with a maximum capacity of 30 megawatts, is designed to start in as little as eight minutes, and will reach full load in 20 to 30 minutes.

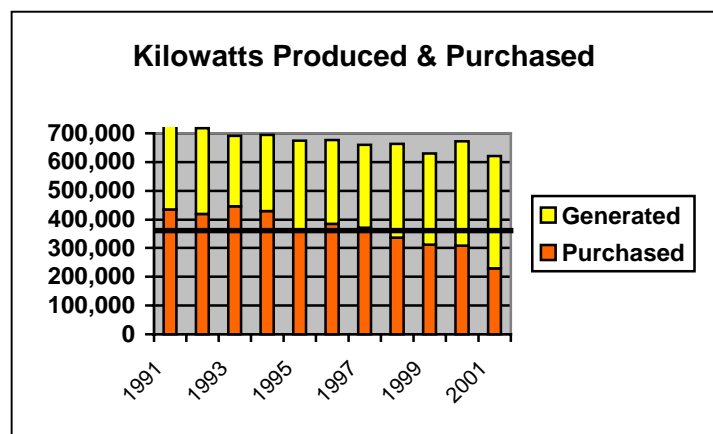
### CONSTRAINTS OF EXISTING CONTRACT WITH DETROIT EDISON:



In 1991, the City entered into an 18-year operating contract with Detroit Edison, which contains the following conditions:

- ◆ Tie-line purchase capacity is limited to 85 megawatts per hour.
- ◆ Public Lighting must purchase 16 megawatts of power continuously, at a set rate.
- ◆ Public Lighting must purchase a minimum of 200,000 megawatts of interruptible power annually. Public Lighting's cost for interruptible power varies

according to Edison's demand for that power. In 1994, the contract was amended to set a firm price on interruptible power purchased between 7 pm and 11 am. Additional price changes negotiated in 1998 result in \$1 - \$1.5 million in savings annually. Interruptible power purchased between 11 am and 7 pm continues to be priced at an incremental price that averages \$35 per megawatt hour.





In total, the Public Lighting Department must purchase 340,160-megawatt hours annually from Detroit Edison, or pay for the contracted power that has not been used. As shown on the chart above, PLD has not met the minimum purchase requirements of the contract since the 1997 fiscal year.

## SYSTEM CONSTRAINTS:



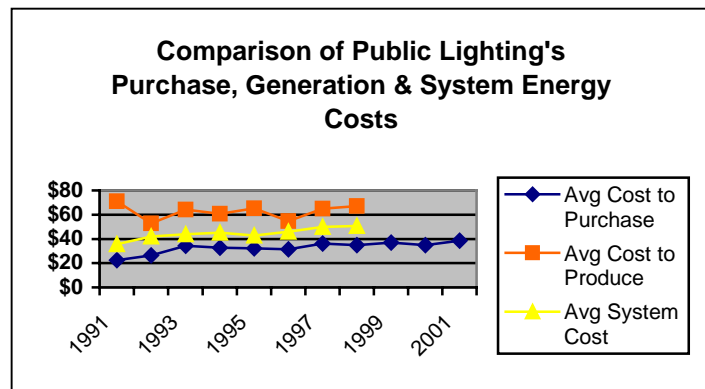
In 2001, the Public Lighting Department completed the installation of a fourth tie-line to Detroit Edison's Waterman Sub-Station, and began work on a fifth line. The tie lines are the Public Lighting Department's connection to outside power and allow Public Lighting to either purchase needed energy or sell any excess energy. With the installation of the fifth line, tie-line capacity could reach 109.2 megawatts in the summer and 123.5 megawatts in the winter, but it is limited by contract to 85 megawatts.



To take the interruptible power from the Public Lighting Department, Detroit Edison must give a one-hour warning. At that time, the Public Lighting Department must begin generating more power in order to cover its customers' load. To take full advantage of price differences on interruptible power, the Public Lighting Department should be able to increase or decrease capacity by 69 megawatts within an hour. However, the Public Lighting Department's generation equipment does not have that flexibility. The Quick Start unit can reach its full generating capacity in 20 minutes; however, the older units require 8 to 16 hours to begin generating power depending on whether the units are filled with water and temperature of the water within the units. Therefore, the Public Lighting Department is forced to produce energy even when it would be more cost effective to purchase energy.



The graph on the right shows a comparison between the Public Lighting Department's purchase, production and system costs. Fully loaded costs, those including the power plant operating costs, were not available for 1999 through 2001 when this report went to print. Public Lighting Department management did not know when its cost allocation reports for the most recent years would be prepared and available for review.



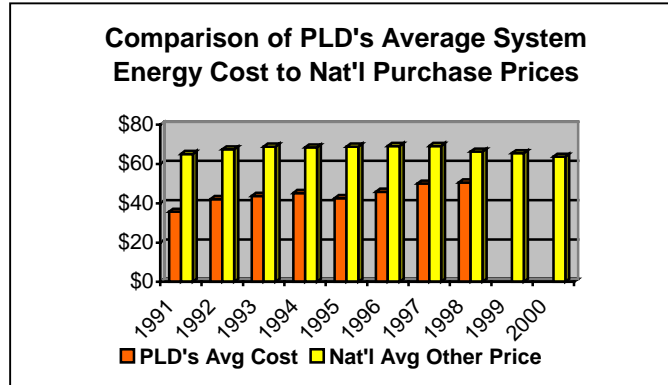
It is expected that production and system costs per megawatt, if available, would show higher costs than in previous years due to the increase in energy generation amounts (higher price) and the lower energy purchase amounts (lower price not achieved plus the penalty for not purchasing the contracted quantity).



## COST OF PURCHASED POWER & INCREMENTAL COST OF PRODUCING



Because the Public Lighting Department is in the power generating business, it is able to purchase power at utility interchange pricing rather than pay higher wholesale rates.



From a price standpoint - as long as the overall cost of the Public Lighting Department's generated and purchased power is less than the price that the City would pay for wholesale electricity, then the Public Lighting Department is achieving its goal of delivering economic energy to its customers. Because the allocation reports have not been prepared in recent years, data is not available to determine whether the Public Lighting Department is achieving this goal.

## POWER DISTRIBUTION:



The Public Lighting Department's power is transmitted from the Mistersky Power Plant through 24k volt underground cables to 31 sub-stations throughout the City. At the sub-stations, the voltage is stepped down to the distribution voltage of 4,800 volts, and is distributed by underground cable or overhead wires to the Public Lighting Department's electric customers, streetlights, traffic signals, and to miscellaneous public lighting uses.



When a fault occurs in the underground distribution system, the thick conduit that runs from manhole to manhole, crews are dispatched to isolate the location of the fault. Once located, working in manholes or hand holes, skilled tradesmen splice the conduit to repair the problem. The process is cumbersome and time consuming, as the wire itself weighs 10 pounds per foot and it takes 8 hours to make one splice. Faults in directly buried wire may take longer to locate and repair. Most directly buried wire faults are due to contractor or homeowner digging.



Spending on the underground distribution system has increased 8% between 1997 and 2001, with a sharp surge in 2000. In 2000, there was also a surge in the number of budgeted FTEs, although between 1997 and 2001, budgeted and actual staffing levels have remained mostly unchanged. Work orders for underground work increased slightly between 2000 and 2001, and the number of miles of underground distribution conduit and cable that has been repaired or replaced has been steadily growing to double that in 1997. Public Lighting has reduced the average number of days to repair an underground fault from 10 to 5 days over the past four years.



UNDERGROUND DISTRIBUTION SYSTEM					
	1997	1998	1999	2000	2001
Underground Construction & Maintenance Spending in Constant Dollars	\$3.6	not available	\$3.6	\$4.5	\$3.9
Budgeted Underground Construction & Maintenance FTEs	52	52	53	58	52
Actual Underground Construction & Maintenance FTEs	43	53	45	42	43
Miles of Underground Conduit & Cable Maintained	540	540	540	540	540
Miles of Underground Conduit & Cable Repaired and/or Replaced	6.0	8.0	8.0	8.0	12.5
Work Orders for Underground System	not available	not available	not available	159	163
Duration of an Outage Due to the Problems in the Underground Secondary Distribution System	not available	10 days	7 days	5 days	5 days

Faults in the overhead distribution system are most often due to downed wires. Over the past several years, the Public Lighting Department has invested heavily in trimming trees around the primary leads, which has substantially reduced the number of power failures attributable to downed wires. A continuous tree-trimming program has been implemented to insure that trees are regularly trimmed circuit by circuit.

Like the underground distribution system, spending has remained constant between 1997 and 2001 except for the sharp surge in 2000. Budgeted positions have increased 12%, while filled positions have declined by 13% between 1997 and 2001. The number of overhead and downed-line work orders has declined due to the tree trimming efforts. The duration of a power outage due to a problem with the overhead wires has been cut in half to 48 hours.

OVERHEAD DISTRIBUTION SYSTEM					
	1997	1998	1999	2000	2001
Overhead Construction & Maintenance Spending in Constant Dollars	\$5.4	not available	\$5.6	\$7.3	\$5.6
Budgeted Overhead Construction & Maintenance FTEs	42	47	50	46	47
Actual Overhead Construction & Maintenance FTEs	46	49	43	42	40
Number of Miles of Overhead Wires Maintained	1,330	1,330	1,330	1,335	1,335
Number of Overhead Work Orders	not available	not available	not available	236	153
Percentage of Primary Leads Trimmed	0%	0%	50%	75%	100%
Number of Downed Line Work Orders	not available	not available	not available	129	94
Duration of an Outage Due to Problems in the Overhead Secondary Distribution System	not available	96 hrs	72 hrs	48 hrs	48 hrs



## ELECTRICAL SYSTEM CONTROL:



A System Control and Data Acquisition System (SCADA) is used to monitor the sub transmission and distribution portions of the utility. The SCADA system allows the Control Center to monitor the megawatt activity – production, purchase, and usage - throughout the system. If an emergency occurs, for example, where demand exceeds supply, portions of the transmission or distribution systems can be shed from the system from this terminal to prevent an overall system failure.



The Control Center, or Gallery, receives calls and diagnoses trouble on electrical services, streetlights, and traffic signals. The Control Center is staffed 24 hours per day, 7 days per week.

- ◆ When a call is received, the operator first determines whether the call involves Public Lighting Department equipment.
- ◆ If Public Lighting Department equipment is involved, the call is prioritized with other calls in the system. Public safety issues, such as wires down or traffic light outages receive the highest priority; followed by building electrical restorations and circuit repairs; and finally street light restorations.
- ◆ Electrical personnel are dispatched to restore electrical services.
- ◆ The system control operator at the Control Center monitors and manages the work and resources to ensure the work is completed.



Electrical system control spending has remained constant over the past five years; budgeted positions have increased by one FTE while filled positions have increased by two. However there is a 24% vacancy rate. Information is not available to determine whether street light modernization efforts have reduced the number of street light trouble calls. Public Lighting has set response time goals for responding to traffic signal (30 minutes) and street light (24 hours) service calls. Public Lighting Department personnel exceed the traffic signal response time goal, but do not always meet the street lighting response time goal.

ELECTRICAL SYSTEM CONTROL					
	1997	1998	1999	2000	2001
Electrical System Control Spending in Constant Dollars (Millions)	\$1.4	not available	\$1.0	\$1.2	\$1.3
Budgeted Electrical System Control Workers	16	16	14	14	17
Actual Electrical System Control Workers	11	12	11	11	13
Number of Street Lighting Calls	not available	not available	not available	not available	15,330
Response Time after a Traffic Signal Service Call	not available	45 min	45 min	30 min	5 min
Response Time after a Street Lighting Customer Call	not available	48 hrs	36 hrs	24 hrs	24 - 48 hrs



Industry reliability measurements include SAIFI, CAIDI, SAIDI, ASAI, and MAIFI, which are defined below. The Edison Electrical Institute (EEI) through its EEI Reliability Survey gathered the 1998 and 1999 national averages shown in the following chart. Sixty-two companies in twenty-six states, including Michigan, participated in the survey. The Public Lighting Department does not currently calculate system reliability statistics; however, management feels that they do have the raw data needed to make the calculations.



SYSTEM RELIABILITY					
	National Averages – Including All Interruptions		National Averages – Excluding Major Storms		Public Lighting Department 2001
	1998	1999	1998	1999	
SAIFI – System Average Interruption Frequency Index – The number of customers interrupted divided by the number of customers served	1.62	1.45	1.38	1.21	not available
CAIDI – Customer Average Interruption Duration Index – Duration of all customer interruptions divided by the total number of customer interruptions	2.78	2.44	1.42	1.80	not available
SAIDI – System Average Interruption Duration Index – Sum of all Customer Interruption Durations divided by the total number of customers served	4.14	3.84	1.69	1.97	not available
ASAI – Average Service Availability Index – Total Hours of Service Availability divided by total number of hours in a year	99.17	99.96	99.85	99.98	not available
MAIFI – Momentary Average Interruption Frequency Index – Total number of momentary interruptions divided by the total number of customers served	7.94	5.85	11.58	5.44	not available

## ELECTRICITY CUSTOMERS:



The Public Lighting Department may sell electricity to any customer that meets the State guidelines. Currently, Public Lighting's customer base is made up of City departments, State and Federal agencies, businesses, and several individuals. The Public Lighting Department does pursue new customers. Public Lighting management believes that its efforts to generate new business are constrained by its power capacity limitations and the perception of its electricity quality.



Six rate structures are available to customers based on electrical usage and type of service. Contracts for new customers are approved by City Council. As a Municipal Utility, the Public Lighting Department is not subject to the rules and regulations of the Michigan Public Services Commission, and supplies information to the Federal Energy Regulatory Commission (FERC) on a voluntary basis.

ELECTRICITY CUSTOMERS					
	1997	1998	1999	2000	2001
Number of Service Customers	136	139	229	229	230
Number of Metered Sites	1,176*	1,179*	1,269*	1,269*	1,270

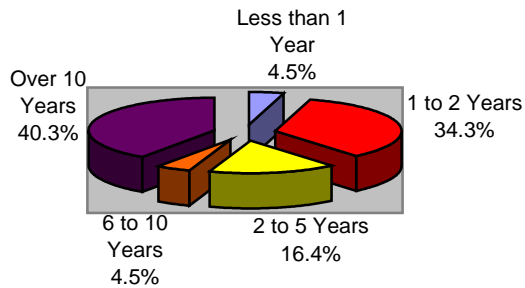
## CUSTOMER SATISFACTION:



A survey was conducted to determine customer satisfaction with the Public Lighting Department's services. The complete survey methodology and results can be found in Appendix B of this report. Select responses are shown below.



### Number of Years as PLD Customer



44.8% of survey respondents have been a Public Lighting Department customer for more than 5 years.



55.2% of the respondents indicated that they have been a customer for less than 5 years.

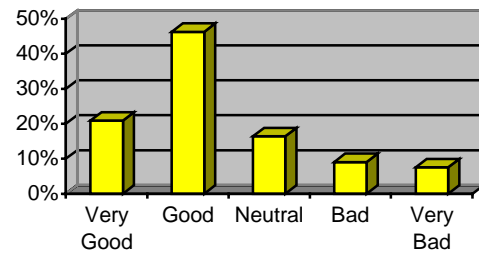


67.2% of respondents felt that the Public Lighting Department's overall service was "Very Good" or "Good".

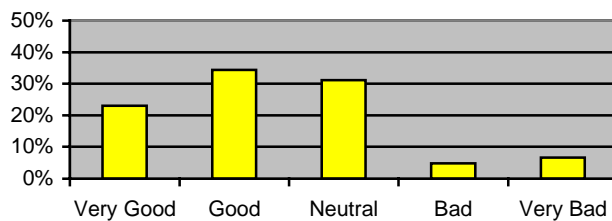


16.4% of respondents felt that their overall service was "Neither Good nor Bad". 16.5% of respondents felt that PLD's service was "Bad" or "Very Bad".

### Overall Service Rating



### Satisfaction with Cost of Service Provided

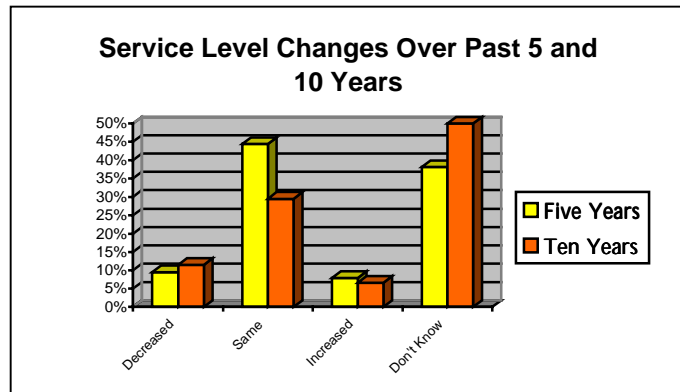


57.4% of respondents rated service cost as "Very Good" or "Good". 31.1% of respondents rated cost as "Neither good nor bad", and the remaining 11.5% of respondents rated cost as "Bad" or "Very Bad".

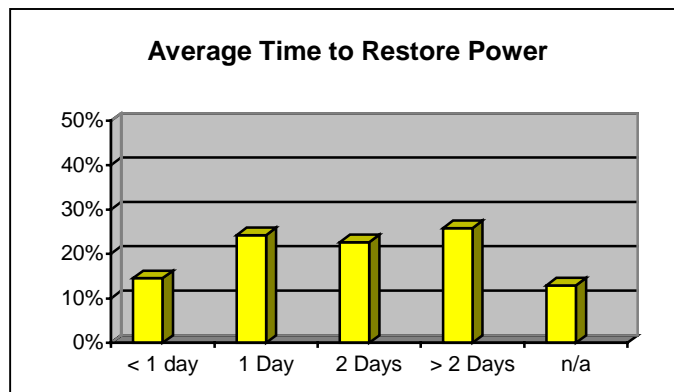


Over the past five years, 44.4% of respondents indicated that their service has “Stayed about the same”, while 38.1% of the respondents didn’t know if their service level had changed.

Over the past ten years, 29.5% of respondents indicated that service has stayed the same, while 52.5% indicated that they didn’t know.



The differences between the five and ten year “Same” and “Don’t Know” responses could be attributable to the differences in the length of time that respondents have been customers.



Opinion is mixed on how long it takes the Public Lighting Department to restore power following an outage.

There does not seem to be a standard length of time, which corresponds to differences in the length of time to repair overhead and underground faults.

## PUBLIC LIGHTING GOAL #2: EXERCISE REGULATORY CONTROL OF THE OVERHEAD LINES & POLES IN CITY RIGHT OF WAYS



### MAINTAINING THE POLES IN THE CITY'S RIGHT-OF-WAYS:



The Public Lighting Department is responsible for regulating the overhead lines and poles in the City's Right of Ways, issuing permits for pole work and construction; and has the authority to order the utilities that own poles take corrective action on the poles, wires or other pole-mounted equipment when they are found to be in violation of the National Life Safety Code.



Detroit Edison and the City of Detroit own the majority of poles located in the right of ways. Over the years, the two companies have standardized joint-use pole practices to allow for the most efficient use of each other's resources. The Public Lighting Department's charter mandate is to provide street lighting, so its poles are generally located on streets. Detroit Edison provides residential power and powers some streetlights, so its poles are located on streets, and in alleys and easements. The Public Lighting Department uses 35', 40', 45', 50', 55', 70' and 80' poles for different circumstances. 70' poles are used to cross channels of water; 80' poles are used for the power production tie lines.



Poles should be inspected every 10 years. The inspection consists of a visual inspection for deep cracks, a density test, and a check for wood rot. If the pole quality is in question, a core drilling may be required to examine the pole quality.



Pole work is performed on requests for new construction, a change to an existing commercial or residential site, increased residential street lighting, or the replacement of an existing pole. New construction, business or residential pole changes can be costly. However, management reports that when Edison or the Public Lighting Department transfer service from old to new poles, the net charges between the companies are minimal.



When a service transfer is needed, Public Lighting and Edison determine the pole's ownership. The owner of the pole is responsible for delivering a new pole to the site. Then, the party requesting the new pole will set and frame the pole and transfer its wires. As the wires are transferred from the old pole to the new pole, usually from the highest to the lowest wires, the pole is cut off a few feet above the next utility. The last utility to remove its wires must also remove the pole butt from the ground and fill the hole.

INSPECTION & CONTROL OF THE CITY'S RIGHT OF WAYS					
	1997	1998	1999	2000	2001
Inspection & Control Spending in Constant Dollars	\$449,842	not available	\$476,474	\$497,515	\$450,313
Budgeted Inspection & Control Workers	6	6	6	6	6
Actual Inspection & Control Workers	5	6	6	4	6
Number of Poles in the City's Right of Ways	213,459	213,650	213,728	213,844	213,925
Percentage of Poles Owned by the City	26.73%	26.80%	26.77%	26.77%	26.78%
Number of Poles Inspected	57,057	150	220	500	400
Number of Poles Replaced	155	600	700	300	250
Inspection Spending per Pole in Constant Dollars	\$7.88	not available	\$8.33	\$8.69	\$7.86



## MISS DIG:



The Public Lighting Department operates a Miss Dig unit to comply with State law. Legislation requires that any person or company planning to perform excavation or demolition work must furnish advance notice to the utility companies. Any utility owning or operating utility lines in the area of the excavation site is required to clearly mark its utilities.



The person performing the excavation work informs "Miss Dig" who notifies the local utility companies. The utility is given a 3-day notice to locate utilities and mark them with spray paint. The utility company must repair utilities that are not clearly marked within this time frame and are damaged by construction; the property owner is responsible for repairing utilities that are marked and are damaged.

MISS DIG					
	1997	1998	1999	2000	2001
Underground Facilities Maps & Records Spending in Constant Dollars	\$269,938	not available	\$262,979	\$291,505	\$291,922
Budgeted Underground Facilities Maps & Records FTEs	4	4	4	4	4
Actual Underground Facilities Maps & Records FTEs	4	4	4	5	4
Number of Miss Dig Requests	not compiled	not compiled	not compiled	not compiled	24,327
Percentage of Requests Responded to Within Required Time Frame	not compiled	not compiled	not compiled	not compiled	not compiled
Number of Requests Per FTE	not compiled	not compiled	not compiled	not compiled	6,082

## PUBLIC LIGHTING GOAL #3: OPERATE & MAINTAIN AN EFFICIENT COMMUNICATIONS SYSTEM FOR THE POLICE, FIRE & PUBLIC LIGHTING DEPTS.



### PUBLIC SAFETY COMMUNICATION SYSTEM:



The Public Lighting Department's responsibility for the operation and maintenance of the Police and Fire Department's communication system dates back to the 1950s when there were telephone wires and direct call boxes on the City's light poles. Although the wires and call boxes are gone, the Public Lighting Department is still responsible for installing and maintaining telephone instruments, switchboards and exchange equipment for City-owned Police, Fire, and Emergency Medical Services telephone systems.



The Public Lighting Department provides system and equipment support for 3-1-1 and 9-1-1 phone systems and acts as a liaison between Ameritech and the Police and Fire Departments. The Public Lighting Department employee processes all of the requests for adds, drops and changes. Information about the number of phones and number of work requests was not available when this report went to print.

PUBLIC SAFETY COMMUNICATIONS SYSTEM					
	1997	1998	1999	2000	2001
Maintaining the Public Safety Communication System in Constant Dollars	not available	\$305,416	\$222,949	\$168,641	\$97,265
Number of FTEs	3	3	3	2	1
Number of Fire phones	not available	not available	not available	not available	not available
Number of Police phones	not available	not available	not available	not available	not available
Number of Public Lighting phones	not available	not available	not available	not available	not available
Number of Adds, Drops & Changes Processed	not available	not available	not available	not available	not available

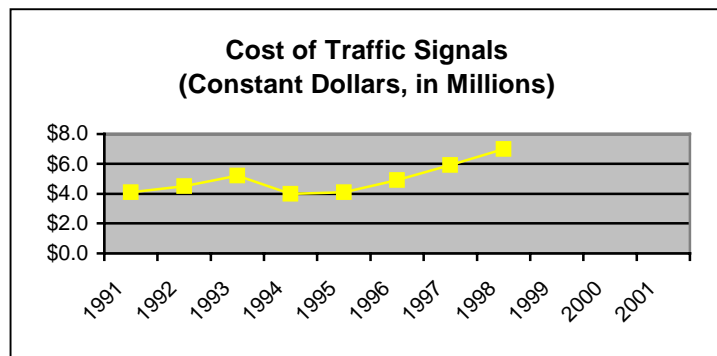
## PUBLIC LIGHTING GOAL #4: OPERATE & MAINTAIN THE CITY'S TRAFFIC SIGNAL SYSTEM



The Public Lighting Department's role in providing a safe street system is to interpret DPW Traffic Engineering's intersection design specifications; order the lighting equipment; assemble, wire and program control cabinets and traffic lights in the shop; erect traffic signal foundations; supply power to the signal; and install and maintain the traffic control equipment.

The City, County and State own, operate and maintain traffic signals within Detroit's city limits. The State maintains the signals on the trunklines, the County is responsible for traffic signal maintenance on those roads designated as county roads, and the City is responsible for maintenance on the remaining streets. Although not responsible for maintenance, the Public Lighting Department does provide power to the State's signals, and is therefore required to respond to trouble calls on its signals, as well as on its own equipment.

The City's cost of providing traffic signal service is reimbursed from the Street Fund. The Street Fund collects the City's portion of State Gas and Weight Taxes and distributes these dollars to the departments that care for the City's roads and traffic.



In the past several years, the Public Lighting Department has been reimbursed for budgeted rather than actual costs because the Department has not produced its allocation reports for the years 1998 to 2001. Based on past trends, it appears as though actual costs are greater than the \$4.0 - \$4.5 million that the Public Lighting Department is receiving from the Street Fund for providing this service. At the time this report went to print, the Public Lighting Department management did not know when the allocation reports would be completed.

More than half of Detroiters rate traffic light reliability and traffic light maintenance as "Very Good" or "Good". The satisfaction rating declines slightly for traffic light restoration following a storm.

	Number of Responses	% of Citizens Rating Service "Very Good" or "Good"	% of Citizens Rating Service "Neither Good nor Bad"	% of Citizens Rating Service "Bad" or "Very Bad"
Satisfaction with Traffic Light Reliability	2,921	56%	28%	16%
Satisfaction with Traffic Light Maintenance	2,892	53%	28%	19%
Satisfaction with Traffic Light Restoration Period Following a Storm	2,809	49%	31%	20%



- Spending on Traffic Signal Design and Engineering has increased 54% between 1997 and 2001, while budgeted positions have increased 50%. Actual staffing has decreased to 50% of the budgeted positions. The Public Lighting Department did not have any data available on the number of requests for new installations. 77% of all traffic signals are operating with the equipment as originally constructed; 23% are safely operating with non-functioning components.

TRAFFIC SIGNAL DESIGN					
	1997	1998	1999	2000	2001
Traffic Signal Design Engineering Spending in Constant Dollars	\$264,312	not available	\$269,520	\$285,184	\$407,871
Budgeted Traffic Signal Design Engineer FTEs	4	4	4	5	6
Actual Traffic Signal Maintenance FTEs	4	4	3	3	3
Number of Traffic Signals Within City Limits	1,767	1,760	1,759	1,759	1,759
Number of City Maintained Signals	1,276	1,269	1,268	1,268	1,268
Total Traffic Signal Work Requests	not available	not available	not available	3,865	3,545
Percentage of Signals Operating With All Equipment Installed As Originally Constructed	not available	not available	not available	not available	77%

- The Public Lighting Department's Traffic Signal Maintenance Unit is responsible for new installations, modernizations, removals, improvements and retiming requests. Broad work categories encompass: responding to trouble calls and making the intersections safe; construction, including new installations, modernizations, repairs, and retiming; and preventative maintenance.

- Measurements of the amount of work (lamps replaced or trouble calls responded to) are not maintained. The maintenance unit does meet the Department's response time goal of 30 minutes 72% of the time, up from 44% of the time in 2000. The average signal restoration period following a storm has decreased from 5 to 3 days over the past 3 years.

TRAFFIC SIGNAL MAINTENANCE					
	1997	1998	1999	2000	2001
Traffic Signal Maintenance Spending in Constant Dollars (Millions)	\$1.5	not available	\$1.2	\$1.4	\$1.9
Budgeted Traffic Signal Maintenance FTEs	12	12	12	12	11
Actual Traffic Signal Maintenance FTEs	12	12	11	10	11
Number of Lamps Maintained	not tracked	not tracked	not tracked	not tracked	not tracked
Trouble Calls Received	not compiled	5,328	5,935	not compiled	not compiled
Lamps Replaced	not compiled	1,168	1,776	not compiled	not compiled
Average Response Time after a Traffic Signal Service Call	not available	45 min	45 min	30 min	45 min
Percentage of Traffic Intersections Made Safe Within 30 Minutes	not available	not available	not available	44%	72%
Average Restoration Period For Traffic Signal Outages After a Storm	not available	5 days	3 days	3 days	3 days
Number of Trouble Calls Per Maintenance FTE	not compiled	444	540	not available	not available

## PUBLIC LIGHTING GOAL #5: PROVIDE RELIABLE, EFFICIENT LIGHTING TO MAKE THE STREETS SAFE



The Public Lighting Department provides street lighting on residential streets and on State trunk lines. The Public Lighting Department is responsible for nearly 87,000 streetlights, 623 lights per square mile, within the City of Detroit. This service includes fixture maintenance and installation, as well as bulb replacement.



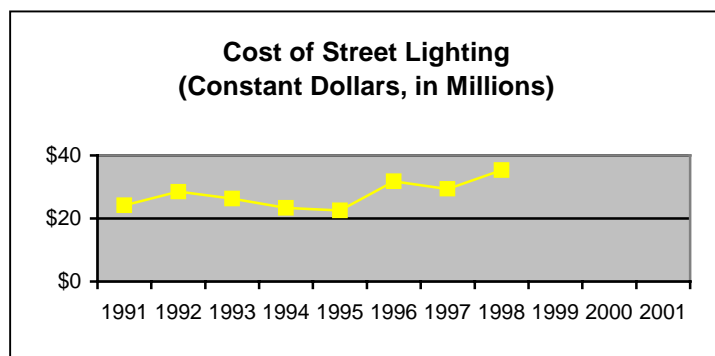
Over the past several years, the Public Lighting Department has modernized many of the residential series circuit, cascade-controlled streetlights to multiple-circuit, and photocell streetlights. In addition, the power source on many of the residential lights has been transferred to Detroit Edison secondary distribution circuits, the same power that is used to light residential houses. Public Lighting continues to maintain its own lights and fixtures, and it has not removed its power lines from the converted street light poles. When there is a report of power outage or a line down, Public Lighting personnel must still respond to the scene.



To date, Public Lighting has replaced 59% of the streetlights with sodium bulbs. The sodium bulbs are brighter, cast a yellow light that doesn't glare like the old blue incandescent lights, and are more environmentally friendly when they are broken. Lighting specifications show that they are also more reliable and serviceable. Public Lighting has completed its major modernization effort; additional bulbs will be changed to sodium as burnt out lights are replaced.



The Department relies on citizen calls to identify light outages. Once identified, most non-storm related outages are repaired within one day unless there are extenuating circumstances surrounding the outage.



Street Lighting costs increased from 1991 to 1997. The cost of providing street lighting service for the most recent years is not available. Again, annual reports showing allocated costs have not been produced for 1998 through 2001.



Outdated cost information does not allow for relevant comparisons to peer cities or allow for the evaluation of services that are provided.



Streetlights are a hot topic for Detroiters. One-third of residents rate their satisfaction with the service as "Good" or "Very Good", while 43% rate the service as "Bad".

	Number of Respondents	% of Citizens Rating Service "Very Good" or "Good"	% of Citizens Rating Service "Neither Good nor Bad"	% of Citizens Rating Service "Bad" or "Very Bad"
Satisfaction With Street Lighting	3,030	33%	24%	43%
Satisfaction With Quantity of Streetlights in Neighborhood	3,197	47%	21%	33%
Satisfaction With Street Light Reliability	3,004	42%	23%	35%
Satisfaction With Street Light Maintenance	3,023	42%	23%	36%
Satisfaction With Restoration of Street Lights Following a Storm	2,768	39%	28%	34%



Spending on streetlight design engineering has increased 196% between 1997 and 2001. The number of budgeted FTEs has decreased by 1, while the number of actual FTEs has decreased to 66% of the budgeted amount. The number of streetlights has remained stable. The Public Lighting Department did not have data available on the number of new installations, and began tracking the number of work orders in 2000. 62% of streetlight work orders are completed within 30 days.

STREET LIGHT DESIGN					
	1997	1998	1999	2000	2001
Street Light Design Engineering Spending in Constant Dollars	\$44,202	not available	\$37,544	\$151,737	\$130,890
Budgeted Street Light Design Engineering FTEs	7	7	7	7	6
Actual Street Light Design Engineering FTEs	6	6	7	5	4
Number of Street Lights	86,932	86,932	86,932	86,932	86,932
Number of New Installations	not available	not available	not available	not available	not available
Total Number of Street Lighting Work Orders	not available	not available	not available	13,544	13,243
Percentage of Street Light Work Orders Completed Within 30 days	not available	not available	not available	not available	62.39%



Streetlight maintenance has decreased 30% between 1997 and 2001, while the number of budgeted FTEs decreased by two. Staffing levels in 2001 were at 71%. Maintenance costs have declined as streetlights were modernized and longer-life sodium lights were installed. Public Lighting management reports an average illumination rate of nearly 95%.

STREET LIGHT MAINTENANCE					
	1997	1998	1999	2000	2001
Street Light Maintenance Spending in Constant Dollars (Millions)	\$2.0	not available	\$3.1	\$1.6	\$1.4
Budgeted Street Light Maintenance FTEs	23	23	22	23	21
Actual Street Light Maintenance FTEs	24	22	22	19	15
Number of Lamps Replaced	not available	not available	not available	not available	not available
Number of Street Lights Modernized	not available	not available	not available	not available	2,088
Number of Alley Lights Removed Due to Alley Easement Conversions	not available	not available	not available	not available	not available
Street Light Maintenance Costs per Light in Constant Dollars	\$23.24	not available	\$35.85	\$18.68	\$15.60
Average Street Light Illumination Rate	not available	not available	not available	not available	94.77%
Average Number of Street Lights Out	not available	not available	not available	not available	4,547